

Exhibit 827-5

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Technical Specification

3rd Generation Partnership Project; Technical Specification Group Services and Systems Aspects; Network architecture (Release 9)



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4.1 The Core Network (CN) entities

4.1.1 Entities common to the PS and CS domains

4.1.1.1 The Home Subscriber Server (HSS)

The HSS is the master database for a given user. It is the entity containing the subscription-related information to support the network entities actually handling calls/sessions.

A Home Network may contain one or several HSSs: it depends on the number of mobile subscribers, on the capacity of the equipment and on the organisation of the network.

As an example, the HSS provides support to the call control servers in order to complete the routing/roaming procedures by solving authentication, authorisation, naming/addressing resolution, location dependencies, etc.

The HSS is responsible for holding the following user related information:

- User Identification, Numbering and addressing information;
- User Security information: Network access control information for authentication and authorization;
- User Location information at inter-system level: the HSS supports the user registration, and stores inter-system location information, etc.;
- User profile information.

The HSS also generates User Security information for mutual authentication, communication integrity check and ciphering.

Based on this information, the HSS also is responsible to support the call control and session management entities of the different Domains and Subsystems (defined in section 3.3 and 3.3a) of the operator as shown in figure 0-a.

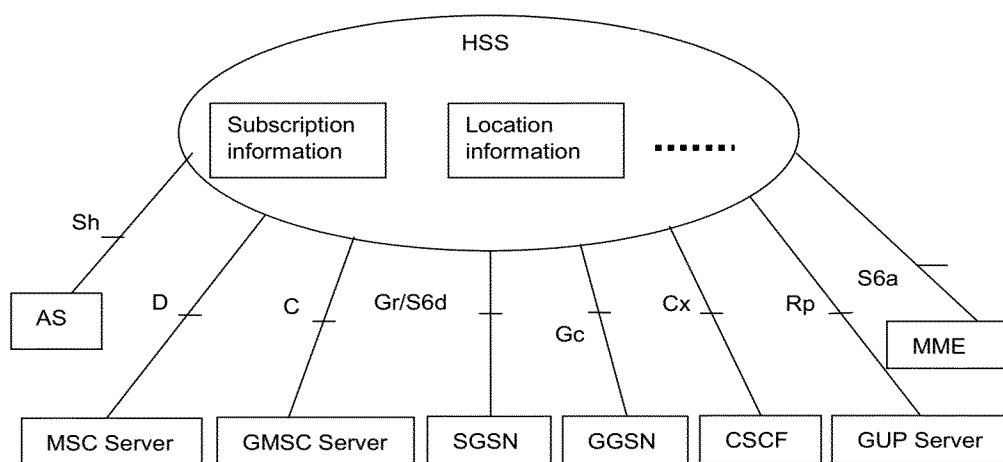


Figure 0-a: Example of a Generic HSS structure and basic interfaces

The HSS may integrate heterogeneous information, and enable enhanced features in the core network to be offered to the application & services domain, at the same time hiding the heterogeneity.

The HSS consists of the following functionalities:

- IP multimedia functionality to provide support to control functions of the IM subsystem such as the CSCF. It is needed to enable subscriber usage of the IM CN subsystem services. This IP multimedia functionality is independent of the access network used to access the IM CN subsystem.

- The subset of the HLR/AUC functionality required by the PS Domain (GPRS and EPC).
- The subset of the HLR/AUC functionality required by the CS Domain, if it is desired to enable subscriber access to the CS Domain or to support roaming to legacy GSM/UMTS CS Domain networks.

The HSS is considered as GUP Data Repository for IM CN Subsystem user related data. The RAF (Repository Access Function) provides the Rp reference point as described in TS 23.240 [71].

The organisation of the subscriber data is outlined in TS 23.008 [5]. It also indicates which numbers, addresses and identifiers specified in TS 23.003 [3] are stored in HSS.

4.1.1.1.1 The Home Location Register (HLR)

The HLR is shown in the Reference Architecture up to and including Rel-4.

The HLR can be considered a subset of the HSS that holds the following functionality:

- The functionality required to provide support to PS Domain entities such as the SGSN, MME and GGSN, through the Gr, S6a, S6d and Gc interfaces and the 3GPP AAA Server for EPS in case of non-3GPP access via SWx and for the I-WLAN through the D'/Gr' interface. It is needed to enable subscriber access to the PS Domain services.
- The functionality required to provide support to CS Domain entities such as the MSC/MSC server and GMSC/GMSC server, through the C and D interfaces. It is needed to enable subscriber access to the CS Domain services and to support roaming to legacy GSM/UMTS CS Domain networks.

4.1.1.1.2 The Authentication Centre (AuC)

The AuC is shown in the Reference Architecture up to and including Rel-4.

The AuC can be considered a subset of the HSS that holds the following functionality for the CS Domain and PS Domain:

- The AuC is associated with an HLR and stores an identity key for each mobile subscriber registered with the associated HLR. This key is used to generate security data for each mobile subscriber:
 - data which are used for mutual authentication of the International Mobile Subscriber Identity (IMSI) and the network;
 - a key used to check the integrity of the communication over the radio path between the mobile station and the network;
 - a key used to cipher communication over the radio path between the mobile station and the network.
- The AuC communicates only with its associated HLR over a non-standardised interface denoted the H-interface. The HLR requests the data needed for authentication and ciphering from the AuC via the H-interface, stores them and delivers them to the VLR and SGSN and MME which need them to perform the security functions for a mobile station.

4.1.1.1.3 HSS logical functions

This section provides a high level and not exhaustive description of HSS functionality.

4a.20 Subscription Profile Repository (SPR)

The SPR logical entity contains all subscriber/subscription related information needed for subscription-based policies and charging control by the PCRF.

4a.21 Service Data Flow Based Credit Control Function

The Service Data Flow Based Credit Control Function performs online credit control functions. It is a functional entity embedded in the Online Charging Function (OCF) within the Online Charging System. (OCS) as specified in TS 32.296 [108].

4a.22 Offline Charging System (OFCS)

The Offline Charging System is logically specified in TS 32.240 [85].

4a.23 Online Charging System (OCS)

The Online Charging System is specified in TS 32.296 [108].

4a.24 Bearer Binding and Event Reporting Function (BBERF)

The Bearer Binding and Event Reporting Function (BBERF) acts as a policy enforcement point for bearer binding, uplink bearer binding verification and event reporting to the PCRF when Gxx applies.

This function entity is located at a GW (e.g. S-GW in the 3GPP access with PMIP based S5/S8 case, HSGW in the HRPD case, A-GW in the non- 3GPP access case).

4a.25 Home (e)NodeB entities

4a.25.1 Home NodeB Subsystem (HNS)

The Home NodeB Subsystem (HNS) consists of a Home NodeB (HNB) and Home NodeB Gateway (HNB-GW). The Home NodeB Subsystem appears as an RNS to the core network and is connected by means of the Iu-CS interface to the MSC and by means of the Iu-PS interface to the SGSN.

A Home NodeB is a Customer Premises Equipment (CPE) offering UTRAN coverage, further details can be found in TS 25.467 [114].

A Home NodeB Gateway is the gateway through which the Home NodeB accesses the core network, more details can be found in TS 25.467 [114].

4a.25.2 Home eNodeB Subsystem (HeNS)

The Home eNodeB Subsystem (HeNS) consists of a Home eNodeB (HeNB) and optionally a Home eNodeB Gateway (HeNB-GW). The Home eNodeB Subsystem is connected by means of the S1 interface to the EPC (Evolved Packet Core), more specifically to the MME (Mobility Management Entity) by means of the S1-MME interface and to the Serving Gateway (S-GW) by means of the S1-U interface.

A Home eNodeB is a Customer-Premises Equipment (CPE) offering E-UTRAN coverage, further details can be found in TS 36.300 [78].

A Home eNodeB Gateway is an optional gateway through which the Home eNodeB accesses the core network, more details can be found in TS 36.300 [78].